

Appl. No. 10/806,590
Amdt. Dated April 13, 2007
Reply to Office Action of January 18, 2007

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REMARKS

Applicant has amended claims 1, 3-6, and 9-13, and canceled claim 2 without prejudice. The amendments find support in the drawings (e.g., Figs. 3-6) and specification of the originally filed application. Thus, no new matter is added part of this response.

Claim Objections

Claims 2-4 and 9-11 are objected to because of the following informalities: As to claims 2 and 9, the use of "formed" is incorrect and should be replaced with "forms". Regarding claims 3 and 10 the word "the" is missing between the words "comprising....steps." Also, "forming pattern in the resist film" should be replaced with "forming a pattern in the resist film." As to claims 4 and 11, the use of "two photo mask step" is confusing and may be replaced with "each photo mask step".

In response, Applicant has canceled claim 2 without prejudice, therefore, the objection relating thereto is now moot.

Claim 9 has been amended the word "formed" to "forms", and claims 3 and 10 has been amended to add the word "the" between the words "comprising....steps" and replaced "forming pattern in the resist film" with "forming a pattern in the resist film", thus, successfully overcome the objection.

Claims 4 and 11 have been amended to, instead, recite that "an aligning step is performed prior to each given photo mask process." Applicant submits that the scope and meaning of such a step is clear and

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definite. As such, Applicant submits that amended claims 4 and 11 successfully overcome the objection.

35 USC §112 Rejections

Claims 3 and 10 are confusing because the phrase, "covering a resist film on the base plate" could have several meanings. It should be replaced with "covering the base plate with a resist film."

In response, Applicant has amended claims 3 and 10, and accepted Examiner advice, thus successfully overcoming the rejection.

Claims 4 and 11 recite the limitation "two photo mask step" in line 2. There is insufficient antecedent basis for this limitation in the claims.

In response, Applicant has amended claims 4 and 11 in the manner set forth above with respect to the objection to those claims. Since amended claim 1 comprises the step of "forming cylindrical recesses in the base plate using a series of photo mask processes", therefore, "each given photo mask process" defined in claims 4 and 11 can find sufficient antecedent basis. Thus, withdrawal of the rejection and allowance of amended claims 4 and 11 are respectfully requested.

35 USC §102 Rejections

Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Andresakis (U.S. Patent 6606792).

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Amended claim 1 recites, in part:

“ ... forming cylindrical recesses in the base plate using a series of photo mask processes, each photo mask process forming a corresponding set of cylindrical recesses, each following photo mask process forming a further respective cylindrical recess in each previously formed cylindrical recess, each following photo mask process yielding a corresponding set of the further cylindrical recesses with a respective smaller diameter than the previously formed set of the cylindrical recesses, the series of photo mask processes including enough such photo mask processes so as to yield a plurality of respectively approximately half sphere-shaped recesses.”

Andresakis discloses a process for forming a printed circuit substrate comprises: depositing a layer of an impedance material 4 on a first surface of a sheet of an electrically highly conductive material 2 (column 6, lines 53-60); etching the impedance material 4 and leaving a pattern of impedance elements on the sheet of highly conductive material 6 (FIGS. 2-3, and column 9, lines 13-27); applying another layer of photoresist 6 to the back side of the sheet of highly conductive material 2, exposing and developing the photoresist 6 (FIGS. 7-8 and column 9, lines 54-58); etching the sheet of highly conductive material 2, and leaving a pattern of conductive lines of the highly conductive material such that at least some of the conductive lines contact at least some of the impedance elements (FIG. 9 and column 9, lines 58-65). However, Andresakis fails to disclose or suggest “forming cylindrical recesses”, as per claim 1, as amended, using the method taught thereby and clearly does not teach or suggest performing a series of photo mask processes in manner “so as to

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yield a plurality of respectively approximately half sphere-shaped recesses", as further recited in amended claim 1.

Applicant further submits that the novel physical features of amended claim 1 produce new and unexpected results over Andresakis.

In Andresakis, the process for forming the printed circuit substrate forms the recesses on the impedance material 4 to form a pattern of impedance elements and forms the recesses on the highly conductive material 2 to form a pattern of conductive lines such that at least some of the conductive lines contact at least some of the impedance elements (FIGS 1-9 and column 9, lines 13-65). That is, the recesses in the highly conductive material 2, effectively, must be not in the recesses on the impedance material 4 for the printed circuit substrate to operate in the manner desired. Therefore, Andresakis teaches away from "each following photo mask process forming a further respective cylindrical recess in each previously formed cylindrical recess", as recited in amended claim 1, thus making it unobvious to modify Andresakis in a manner to provide for such a limitation (MPEP §§2141.02, 2143.01).

Accordingly, amended claim 1 is submitted to be novel, unobvious, and patentable over Andresakis, taken alone or in combination with any other cited reference, under both 35 U.S.C. 102(e) and 35 U.S.C. 103. Reconsideration and withdrawal of the rejection and allowance of amended claim 1 are respectfully requested.

Claim 2 has been canceled without prejudice, therefore, the rejection relating thereto is now moot.

Claims 3-8 depend from amended claim 1. Therefore, Applicant submits that claims 3-8 is also novel, unobvious, and patentable over

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Andresakis under both 35 U.S.C. 102(e) and 35 U.S.C. 103.

35 USC §103 Rejections

Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andresakis (U.S. Patent 6606792) in view of Shu (U.S. Patent Application 2003/0207180).

Claims 9-15 should be allowable as being directly or indirectly dependent on amended claim 1, which is allowable for the reasons set forth above.

Applicant, for the record, notes that Shu only discloses a first opening 16 is formed at a first photo mask process, and a second opening 20 is formed in the first opening 16 at a second photo mask process (Paragraph [0005]-[0006]). However, Shu does not extend its teaching beyond the formation of one cylinder within the originally formed cylinder and does not disclose or suggest using a series of photo mask processes to ultimately etch recesses having relatively complex shapes. Accordingly, Shu clearly fails to disclose or suggest performing a series of photo mask processes in manner "so as to yield a plurality of respectively approximately half sphere-shaped recesses", as recited in amended claim 1. As such, even if Shu could be combined with Andresakis, the combination thereof would not be able to teach or suggest each and every element of amended claim 1.

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Conclusion

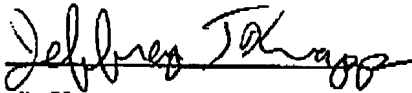
Therefore, all of the objections and rejections are believed to be overcome, and withdrawal of such is respectfully requested.

In view of the foregoing, the present application as claimed in the pending claims is considered to be in a condition for allowance, and an action to such effect is earnestly solicited.

Respectfully submitted,

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